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(71) Applicant (*for all designated States except US*):
FOKKER AEROSTRUCTURES B.V. [NL/NL];
Industrieweg 4, NL-3351 LB Papendrecht (NL).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **ROEBROEKS, Gerardus, Hubertus, Joannes, Jozeph** [NL/NL]; Bom-
melsedijk 2, NL-3528 LB Den Bommel (NL).

(74) Agent: **JORRITSMA, Ruurd**; Nederlandsch Octrooi-
bureau, Scheveningseweg 82, P.O. Box 29720, NL-2502 LS
The Hague (NL).

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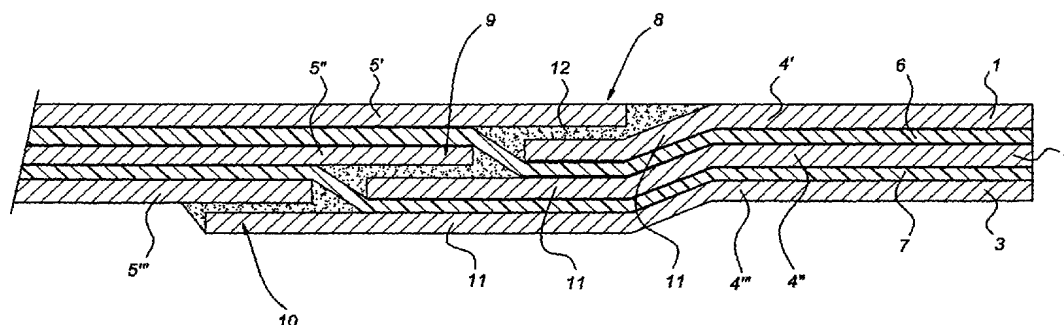
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: JOINT CONSTRUCTION IN A LAMINATE OF METAL AND PLASTIC LAYER



(57) Abstract: A joint construction in a laminate of, alternately, at least two metal layers (1-3) and at least one plastic layer (6,7) accommodated between them comprises metal layers which have at least two sections (4', 5', 4'', 5''). The two sections of at least one outer metal layer (4', 5') overlap one another and are fixed to one another at the location of the overlap (8) by means of an adhesive (12). Each metal layer (1-3) has overlapping sections (8-10) which are fixed to one another by an adhesive (12).



WO 02/078950 A1

Joint construction in a laminate of metal and plastic layers

The invention relates to a joint construction in a laminate of, alternately, at least two metal layers and at least one plastic layer incorporated between them, which metal
5 layers each comprise at least two sections and the two sections of at least one outer metal layer overlap one another, which two sections are fixed to one another at the location of the overlap by means of an adhesive.

A joint construction of this type is disclosed in EP-A 983 141. This known joint construction has three metal layers, between which two plastic layers are accommodated.
10 One of the outer metal layers has two sections which overlap one another in such a way that a smooth surface is obtained. The spaces next to the overlap are filled with the glue by means of which the overlapping parts of the sections are fixed to one another.

The other metal layers and the plastic layers continue on at the location of the overlap. These other metal layers also consist of two sections, the leading edges of which
15 abut one another. The outer layer thereof is provided with a glued fixing strip at the location of the leading edges, which fixing strip, together with the plastic layer located on the other side of the sections, must provide for the transfer of force between said sections.

This known joint construction has a number of disadvantages. First of all the seam between the sections with leading edges abutting one another must have fairly accurately
20 prescribed dimensions. This means that the sections themselves must have fairly accurate dimensions and also that the sections must be positioned accurately with respect to one another. A further disadvantage is that an additional joining strip has to be applied to one of the free sides of the joint construction. For these reasons a joint construction of this type is relatively inconvenient and expensive.

25 The aim of the invention is to provide a joint construction of the type described above that can be produced more simply. Said aim is achieved in that each metal layer has overlapping sections which are fixed to one another by means of an adhesive.

In the case of the joint construction according to the invention all sections can be produced and positioned with respect to one another with wide tolerance. The cost can
30 consequently remain relatively low, without, however, this leading to inaccuracies or insufficient strength.

In this context the joint construction can be so constructed that the overlap between two sections of a metal layer is offset with respect to the overlap between two sections of

another metal layer.

The outside of the joint construction is continuous and smooth if, in each metal layer, one section is straight and the other section is joggled. Such an embodiment is important when the joint construction is used in panels for aircraft and the like.

5 The invention will be explained in more detail below with reference to an illustrative embodiment shown in the figure.

10 The figure shows a cross-section through a joint construction according to the invention. This joint construction comprises three metal layers 1 - 3, each of which consists of two sections 4', 5'; 4'', 5''; 4''', 5'''. Two layers of plastic material 6, 7, which, for example, consist of a matrix of glass fibres embedded in a resin, are arranged between the metal layers 1 - 3

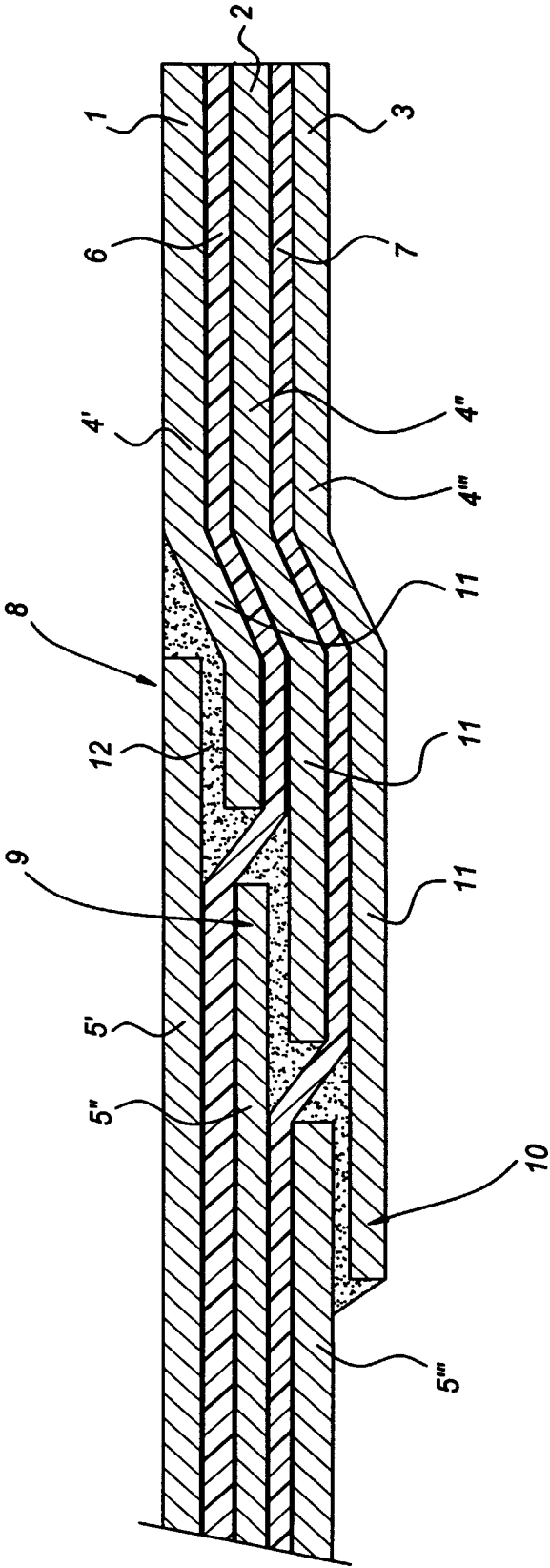
15 The sections 4' - 5''' of each of the layers 1 - 3 overlap one another at the location of an overlap 8 to 10. For this purpose the one section 4' of the outer metal layer 1 has a section 11 that is joggled on and extends to below the other section 5'. The sections 4' and 5' are glued to one another at the location of the overlap 8 by means of a layer 12 of glue.

For the sections 4'', 4''' of the other layers 2, 3 it is also the case that the section 11 thereof is joggled and extends to below the other section 5'', 5''' of said metal layer 2 or 3, respectively.

The plastic layers 6, 7 run through continuously at the location of the overlap 8 - 10.

Claims

1. Joint construction in a laminate of, alternately, at least two metal layers (1 - 3) and at least one plastic layer (6, 7) incorporated between them, which metal layers (1 - 3) each
5 comprise at least two sections (4', 5'; 4'', 5''; 4''', 5''') and the two sections (4', 5') of at least one outer metal layer (1) overlap one another (8 - 10), which two sections (4', 5') are fixed to one another at the location of the overlap (8) by means of an adhesive (6), characterised in that each metal layer (1 - 3) has overlapping sections (4', 5'; 4'', 5''; 4''', 5''') which are fixed to one another by means of an adhesive (6).
10
2. Construction according to Claim 1, wherein the overlap (8) between two sections (4', 5') of a metal layer (1) is offset with respect to the overlap (9, 10) between two sections (4'', 5''; 4''', 5''') of another metal layer (2, 3).
- 15 3. Construction according to Claim 1 or 2, wherein, in each metal layer (1, 3), one section (5', 5'', 5''') is straight and the other section (4', 4'', 4''') is joggled.
4. Construction according to Claim 1, 2 or 3, wherein each plastic layer (7, 8) is joggled at the location of an overlap (8, 10).
20
5. Construction according to Claim 1, 2, 3 or 4, wherein each plastic layer (7, 8) is continuous at the location of an overlap (8, 10).



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED

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IPC 7 B32B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 53989 A (AKZO NOBEL NV ;ROEBROEKS GERARDUS HUBERTUS JO (NL)) 3 December 1998 (1998-12-03) cited in the application the whole document	1
A	US 5 160 771 A (LAMBING CYNTHIA L T ET AL) 3 November 1992 (1992-11-03) the whole document	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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A document defining the general state of the art which is not considered to be of particular relevance

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O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* & * document member of the same patent family

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Ibarrola Torres, O

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PCT/NL 01/00353

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9853989 A	03-12-1998	AU 8435298 A EP 0983141 A	30-12-1998 08-03-2000
US 5160771 A	03-11-1992	NONE	

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INVENTOR-INFORMATION:

NAME	COUNTRY
ROEBROEKS, GERARDUS HUBERTUS JO	NL

ASSIGNEE-INFORMATION:

NAME	COUNTRY
FOKKER AEROSTRUCTURES B V	NL
ROEBROEKS GERARDUS HUBERTUS JO	NL

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ABSTRACT:

CHG DATE=20021101 STATUS=O>A joint construction in a laminate of, alternately, at least two metal layers (1-3) and at least one plastic layer (6,7) accomodated between them comprises

metal layers which have at least two sections (4',5',-4'',5''). The two sections of at least one outer metal layer (4',5') overlap one another and are fixed to one another at the location of the overlap (8) by means of an adhesive (12). Each metal layer (1-3) has overlapping sections (8-10) which are fixed to one another by an adhesive (12).